



# **NOAA Marine and Aviation Operations Marine Operations Center-Pacific Pier Fire Incident**



**October 6, 2006**

**U.S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
Office of the Chief Administrative Officer  
Safety and Environmental Compliance Office**

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## **Executive Summary**

The National Oceanic and Atmospheric Administration (NOAA) and its Office of Marine and Aviation Operations operates the Marine Operations Center - Pacific, located in Seattle, Washington. It is one of two, the other being the Marine Operations Center - Atlantic, located in Norfolk, Virginia. The Centers provide administrative, budgetary, personnel, electronic and marine engineering and logistical support to NOAA vessels that support the various NOAA programs. The Seattle Marine Operations Center - Pacific is situated on the southeast shore of Lake Union and consists of the following leased facilities: several large buildings containing administrative offices and shop facilities, associated parking lots, and two large piers for docking NOAA vessels.

On Wednesday, July 5, 2006, at approximately 01:00 hours, a fire erupted on the south pier (Pier A) of the Marine Operations Center - Pacific which ultimately consumed both piers, destroyed one small boat, two smaller buildings (Boiler Shed and Maintenance Shop), and damaged the NOAA Ship *ASSERTIVE*. The fire was completely extinguished on Friday, July 7, 2006 by the Seattle Fire Department.

There were no injuries to NOAA employees or contractors during this incident; however, six Seattle Fire Department firefighters received minor injuries while fighting the fire.

Based on preliminary property loss estimates, NOAA's Chief Administrative Officer determined the criteria for deployment of a NOAA Incident Investigation Team had been triggered, and directed the establishment of an investigation team under the direction of the Director of NOAA's Safety and Environmental Compliance Office. This incident investigation team included several members from outside NOAA including the following: City of Seattle Fire Department, U.S. Naval Station Everett, and the Department of Commerce's Office of Security. The expertise of these individuals was critical to uncovering the cause of this fire.

Preliminary findings made by the Seattle Fire Departments Investigative Unit, were that the fire was electrical in nature and suspicion was placed on the shore power electrical system servicing the NOAA Ship *ASSERTIVE*. After an exhaustive investigation, detailed within this report, the NOAA Incident Investigation Team determined that the incident was not due to the shore power electrical system, but was most likely the result of an electrical malfunction due to deterioration of pier wiring and a switch panel. This malfunction led to an electrical fault that generated sparks and molten metal, which fell on and ignited the dry creosote treated timbers on the platform below the head of the Pier A.

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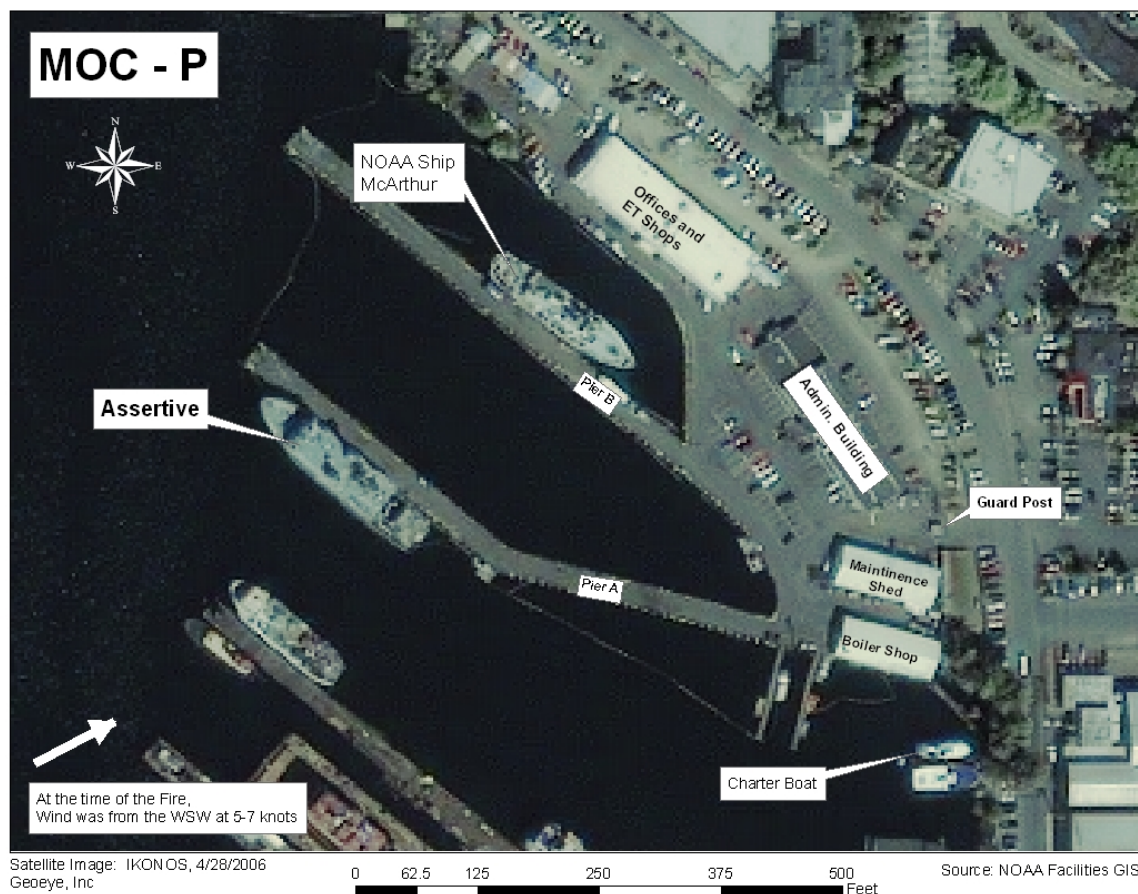
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## I. Operational Description

NOAA's Office of Marine and Aviation Operation (NMAO) operates two marine operation centers, one located in Norfolk, Virginia (Marine Operation Center-Atlantic), the other located in Seattle, Washington (Marine Operation Center-Pacific) serving the NOAA ships. The Marine Operations Center-Pacific (MOC-P) is located on Lake Union in Seattle Washington. The Center provides administrative, budgetary, personnel, electronic and marine engineering, and logistical support to NOAA vessels that support the various NOAA programs.



## II. Incident Narrative



Based on information and evidence collected by NOAA's Incident Investigation Team, on July 5, 2006, at approximately 01:00 hours, a fire erupted underneath the south pier (Pier A) at MOC-P. Listed below is a timeline of the events beginning with the issuance prior to the incident of a safety email from the MOC-P Commanding Officer, through the time the visitors arrived to view the 4<sup>th</sup> of July fireworks display at Lake Union, and ending with the arrival of the NOAA Investigation Team at the scene of the fire:

Thursday, June 29, 2006

- 13:48 – MOC-P Commanding Officer sends an email to MOC-P employees detailing the procedures and restrictions to be followed by employees and guests wishing to use MOC-P as a vantage point to view the City of Seattle fireworks display over Lake Union on the 4<sup>th</sup> of July. This email prohibits the use of fireworks and alcoholic beverages on MOC-P property. (Enclosure 1)



Tuesday, July 4, 2006

- ~17:30 – MOC-P employees and their guests begin to arrive at MOC-P to view the City of Seattle's fireworks display. This display, provided by the City of Seattle from the middle of Lake Union, is viewable from the piers at MOC-P<sup>1</sup>.
- 18:00 – Facility manager arrives at MOC-P<sup>1</sup>.
- 21:45 – MOC-P security guard reports to facility manager the presence of fireworks on the pier and the facility manager directs visitors to stop all fireworks use immediately<sup>1</sup>.
- 22:00 – Casual laborer shuts off the power to the light standard located at the end of Pier A as well as the navigational lights, by turning the respective disconnect switches, mounted on the pole, to the off position to allow for better viewing of the fireworks show<sup>2</sup>.
- ~22:10 – The City of Seattle fire works display begins.
- ~22:40 – The City of Seattle fire works display ends.
- ~22:43 – Guest on the end of Pier A re-energizes the light standard at the end of Pier A using the disconnect switch on the light pole<sup>3</sup>.
- ~22:45 – Casual laborer re-energizes the navigational lights at the end of Pier A using the disconnect switch on the light pole<sup>2</sup>.
- ~22:50 – Visitors start to depart MOC-P.
- 23:30 – A charter boat equipped with Forward Looking Infrared Radar (FLIR), for night time navigation, returns to the pier next to MOC-P, sailing directly alongside MOC-P Pier A. The boat's FLIR detects no fire or hot spot on MOC-P Pier A at this time. (The charter boat captain later indicated that, had there been a fire or hot spot at that time, he would have surely noted it on his FLIR<sup>4</sup>.)
- 23:35 – MOC-P Facility Manager departs from MOC-P<sup>1</sup>.
- 23:40 – All visitors have departed MOC-P and the station is secured. MOC-P Security begins to make the midnight security rounds<sup>1</sup>.

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<sup>1</sup> Based on an interview with MOC-P Security

<sup>2</sup> Based on an interview with the Casual Laborer

<sup>3</sup> Based on an interview with MOC-P Guest

<sup>4</sup> Based on an interview with the Seattle Fire Lead Investigator

Wednesday, July 5, 2006

- 00:30 – Security guard completes rounds, noting nothing abnormal<sup>1</sup>.
- ~01:00-01:15 Fire erupts underneath Pier A<sup>4</sup>.
- 01:20 – A local citizen reports the fire to the 911 dispatcher<sup>4</sup>.
- 01:23 – An off duty harbor patrol officer stops at the MOC-P security guard station and reports the fire to the guard on duty. MOC-P security guard is on the telephone reporting the fire to the 911 dispatcher. (During later interviews the guard related that at that time the fire appeared to be burning approximately 15-20 feet back from the end of the pier and burning from the waterline to the top of the pier<sup>1</sup>.)
- 01:29 – Seattle Fire Department (SFD) arrives on the scene<sup>4</sup>.
- ~01:30 – Four traffic cameras from a local broadcast station (KING 5) mounted on three antenna towers located on the other side of Lake Union are recording the MOC-P fire<sup>5</sup>.
- 01:30 – The end of the pier is obstructed in smoke; however, the spot light on the end of Pier A is visibly on<sup>5</sup>.
- 01:36 – The spot light on the light pole on the end of Pier A is still on with flames reaching past the bow of the ASSERTIVE underneath the pier<sup>5</sup>.
- 01:39 – The light pole light is still on with flames progressing down Pier A<sup>5</sup>.
- ~01:40 – The light pole on Pier A is out. (The 277V circuit breaker servicing the light standard was later found in the tripped position.)
- 01:45 – The fire is moving down the pier towards the shore line, approximately 10 feet per minute<sup>5</sup>.
- 01:47 – SFD observes electrical arcing on the Pier A deck and secures the ship-to-shore power supply by switching the power off at the breaker box located in the Maintenance Shop<sup>4</sup>.
- ~05:25 – The MCARTHUR II is pulled away from Pier B<sup>4</sup>.

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<sup>5</sup> Based on KING 5 Video Footage

Wednesday, July 5, 2006 (cont'd)

- 05:30 – MOC-P Director instructs all employees and contractors not to report to MOC-P until further notice.
- ~05:37 – The ASSERTIVE is pulled away from Pier A<sup>5</sup>.

Thursday, July 6, 2006

- The effort to extinguish the fire continues throughout the day Thursday. The SFD is battling several hot spots underneath the Equipment (boiler) Shed Building which they are not able to reach with a stream of water from their fire hoses due to the construction design of the floor joists. SFD is forced to punch a hole into the six inch concrete slab to gain access to these hot spots to extinguish the fire.

Friday, July 7, 2006

- 11:30 – The fire is declared extinguished. Seattle Fire Department Investigation Unit (SFIU) takes charge of the scene to determine the origin of the fire. The Bureau of Alcohol, Tobacco and Firearms (ATF) assist SFIU in the determination of cause, but since ATF determines the cause was not due to a criminal act, the SFIU retains jurisdiction.
- 15:00 – Through a press release, the Seattle Fire Chief announces the cause of the fire was accidental and caused by an electrical problem in the ship-to-shore power system to the research vessel ASSERTIVE (enclosure 2).
- 15:10 – The NOAA Chief Administrative Officer (CAO) directs the Director of the Safety and Environmental Compliance Office to initiate a NOAA Incident Investigation Team, and to assemble a team to investigate the cause(s) and contributing factors associated with this fire and determine what measures NOAA should institute to prevent or reduce the extent of loss from a similar future event.

Saturday, July 8 – Sunday, July 16, 2006

- NOAA's Incident Investigation Team, for this specific investigation, is assembled.

Monday, July 17, 2006

- 08:00 – NOAA Incident Investigation Team Lead, who arrived the night before, conducts a tour of the scene at MOC-P and the ASSERTIVE.
- 12:00-18:00 – The rest of the NOAA Incident Investigation Team arrive in Seattle.

Tuesday, July 18, 2006

- 07:30 – NOAA Incident Investigation Team convenes and proceeds to conduct the investigation.

### **III. Personnel Injuries**

There were no injuries to NOAA employees or contractors reported as a result of this incident; however, a total of six fire fighters from the SFD were treated for minor injuries while fighting this fire.

## IV. NOAA Incident Investigation Team

Upon notification of the details of the incident, NOAA's Chief Administrative Officer determined this incident met the criteria for invoking the NOAA Incident Investigation Procedure, and the deployment of a NOAA Incident Investigation Team. An investigation team was selected and an appointment letter was issued to each member (enclosure 3). The investigation team was composed of:

**John Pierson** – Investigator-In-Charge, NOAA Director, Safety and Environmental Compliance Office, Silver Spring, Maryland

**Thomas J. de Seve Jr.** – Assistant Director, Client Security Services Division, Office of Security, Department of Commerce, Washington, D.C.

**Mickel D. Amend** – Senior High Voltage Electrician, United States Naval Station Everett, Everett, Washington

**Craig H. Davillier** - Fire Fighter/ Inspector, Seattle Fire Department

**Ronald Mattox** – Safety Officer, NOAA Safety and Environmental Compliance Office, Kansas City, Missouri

**Joe Duran** – Safety Officer, NOAA Safety and Environmental Compliance Office, Seattle Washington

The team also assembled subject matter experts. These individuals were not part of the internal investigation team discussions but offered specific information as it pertained to the incident. These individuals were:

**Bill Cunningham** – NOAA Marine and Aviation Safety and Environmental Compliance Office, Silver Spring, Maryland

**Tino Escalona** – Electrical Engineer, NOAA Project Planning and Management Division, Seattle, Washington

**Ferenc X. Feher** - Captain, Seattle Fire Department Investigation Unit

The NOAA investigators were guided by the Terms of Reference (enclosure 4), for this investigation.

## V. Facts and Findings: Most Likely Cause

### A. Electrical Short in the Pier Navigational Lighting -- Pier A (underneath)

There was a 277 volt electrical service wire inside a 3/4" electrical conduit mounted underneath the pier deck running from the Maintenance Shop to an electrical box on the light pole standard. At this electrical box the power then branches to: 1) the main light on the pole located at the end of the Pier A, and 2) to a fuse box before proceeding to a step-down transformer which brought the voltage down to 120 volts and then branching again to two navigational lights on the end of Pier A. This 277 volt circuit was servicing a light standard (Fig. 1) and two navigational lights (Fig. 2) at the end of the pier, as well as several light standards around the Maintenance Shop and Pier A area.

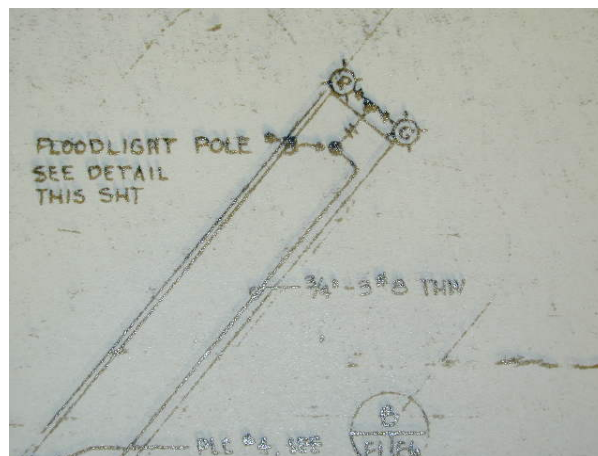


Fig. 1

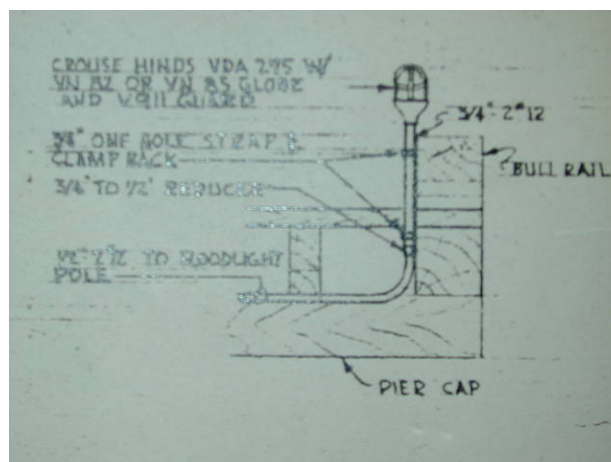


Fig. 2

Pieces of the conduit located further down the line towards the direction of the Maintenance Shop were pitted with holes going all the way through the conduit walls (Fig. 3).



Fig. 3

The fuse between the 277 volt power system and the right pier navigational light appeared to have slowly burned out (Fig. 4). This fuse was examined closely after removal from the fuse box (Fig. 5).



Fig. 4



Fig. 5



The copper wiring directly below the right navigational light displayed uniform copper beads, (Fig. 6), indicating an electrical short had occurred at that point in the wires. A close up picture of the melted copper ends is depicted in Fig. 7.



Fig. 6

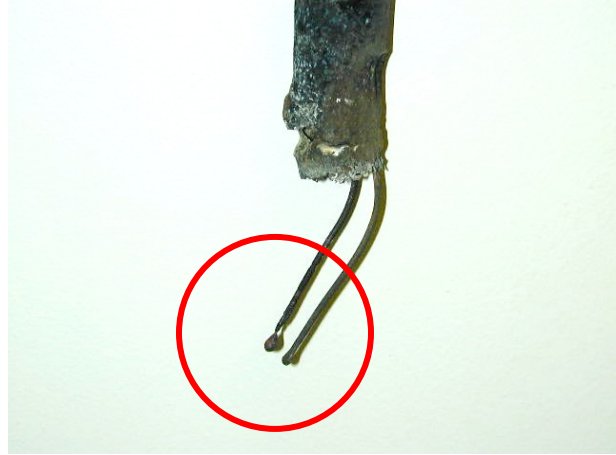


Fig. 7

This piece of wire (Fig. 8) with uniform beads of melted copper on each end, typical of arced wire, was collected from the charred utility platform directly below the right navigational light.



Fig. 8

A close up of the wire strand with the melted insulator inside the melted copper center is indicative of an electrical arc within the copper wire caused by a short circuit between the wire and the metal conduit (Fig. 9). As indicated above, this wire was collected from the utility platform (Fig. 10) located directly below the right navigational light.



Fig. 9



Fig. 10

The disconnect switch on the light standard showed signs of corrosion and oxidation and was reported by the facility manager as the original wiring installed in 1963 (Fig. 11).



Fig. 11

The security guard on duty reported the fire was burning from the surface of the water to the top of the deck and back approximately 15 to 20 feet from the end of the pier at 01:23 hours on July 5, 2006, when he reported the fire.

The KING 5 video footage from the Queen Anne Hill tower camera shows the fire burning at 01:35 hours on the end of the south pier and towards the bow of the ASSERTIVE.



## VI. Facts and Findings: Other Less Likely Causes

### A. Ship-to-Shore Electrical Power System (Power Cable)

The shore power cable servicing the ASSERTIVE was pulled apart at the center section when the tugboat pulled the ship away from its pier mooring location at approximately 05:37 on July 5, 2006. One section of the ship-to-shore power cable remained on the ship (Fig. 12), the other section of the cable on the pier deck (Fig. 13). The shore power cable insulation was burned off the copper conductors (wire strands) but the frayed conductor ends showed no signs of arcing or electrical overheating.



Fig. 12

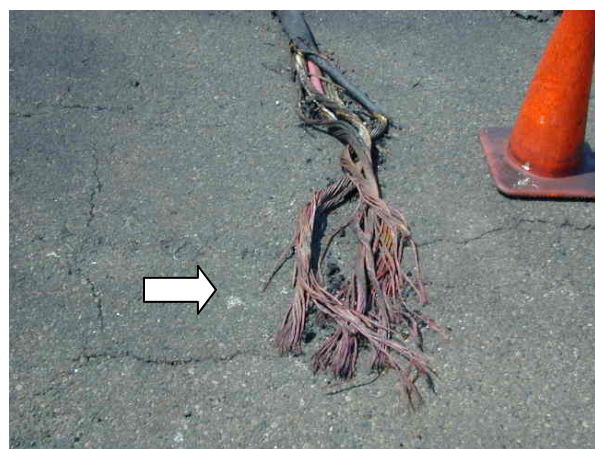


Fig. 13

The shore power cable was spliced at approximately 10-15 feet from the ship side plug. These were crimped lugs bolted together and wrapped in electrical tape (Fig. 14 and 15). The splices showed no signs of damage or overheating.

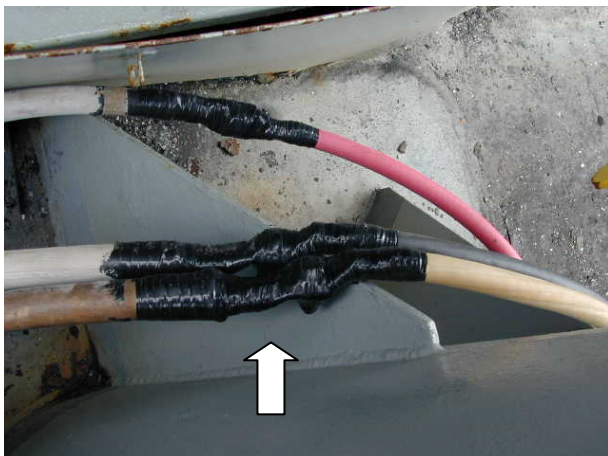


Fig. 14

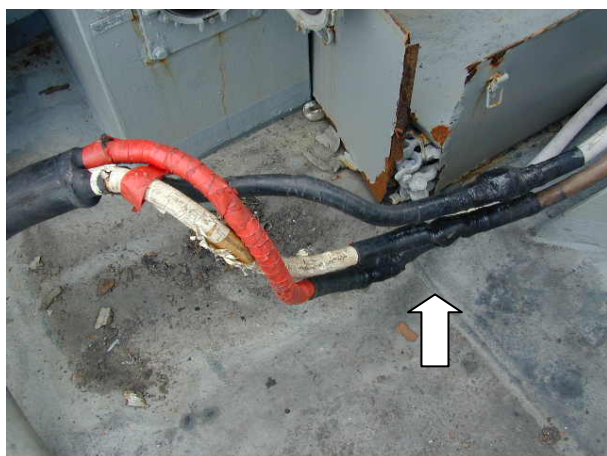


Fig. 15

The shore power cable end plug and ship's receptacle (Fig. 16 and 17) showed no signs of damage, arcing or overheating.



Fig. 16



Fig. 17

The shore power cable that remained on the pier was draped through a knock out hole (Fig. 18) and was hardwired to the lugs on the electrical panel (Fig. 19). The lug connections showed no signs of damage, arcing or overheating.

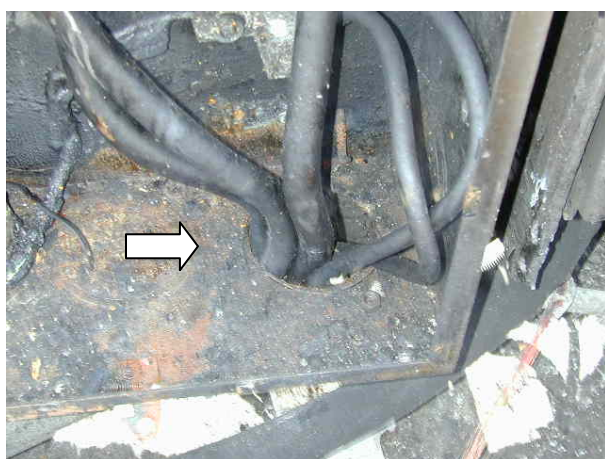


Fig. 18

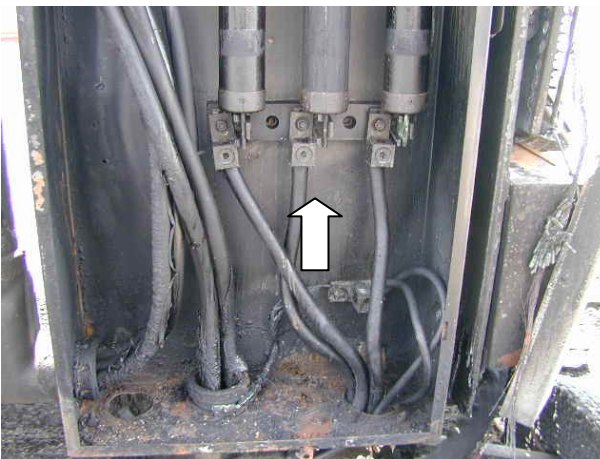


Fig. 19

Both parts of the shore power cable, the part which remained on the pier and the part which remained attached to the ASSERTIVE, were evaluated by Canyon Motor Rewind Inc. (a local company with the expertise to conduct destructive and non-destructive testing on electrical ship-to-shore power cables). Their evaluation concluded, "There was no indication what-so-ever that the shore power cable or the cable terminations were the cause of the fire on the pier" (enclosure 5).



## B. Auxiliary Power Cable -- Multiple Receptacle Ship-to-Shore Power Supply

There was a multiple receptacle electrical power station (Fig. 20 red arrow) located on the Pier A deck with its power supply cable draped underneath the pier. The cable came up from underneath the pier next to the electrical panel (Fig. 20 blue arrow), but the cable leads were not connected to the electrical panel. The leads were insulated (with electrical tape) and moved to the side (Fig. 21). The facility manager reported that these leads were moved to allow room for the ASSERTIVE shore power cable hook-up several months before the fire. This cable was not energized at the time of the fire. Although the cable was not energized, the use of flexible wire for fixed wiring purposes is precluded by Code of Federal Regulation, Title 29 Part 1910.(g)(1).



Fig. 20

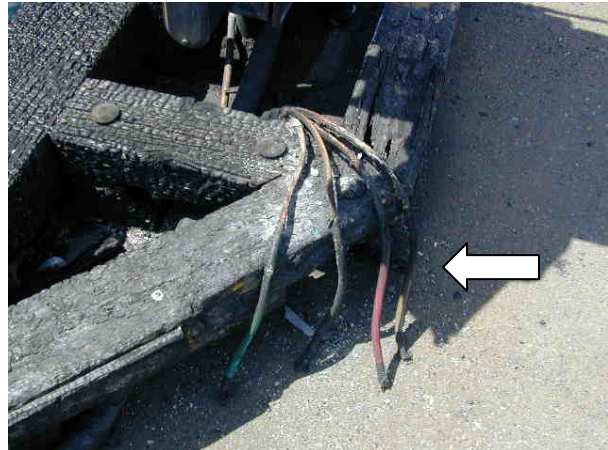


Fig. 21

### C. Fireworks

The guard reported fireworks usage on Pier A to the facility manager at approximately 21:45 on July 4, 2006. Spent fireworks casings (Fig 22) were discovered by the investigators in the dumpster located on Pier A. (Fig. 23).



Fig. 22



Fig. 23

The facility manager stated he reminded individuals on the pier that fireworks were not permitted at MOC-P after the matter was reported to him by the guard and such activity stopped. No further use of fireworks on the pier was noted by the guard or other visitors at MOC-P.

Several additional reports of fireworks use in the vicinity of the pier during the night of July 4, 2006 were investigated, but no indication of fireworks use immediately adjacent to the pier after approximately 21:45 hours was discovered.

### D. Arson, Terrorism or Other Criminal Acts

Nothing was discovered by the investigation team indicating either arson or other criminal act. Since these potential causes were eliminated by both Seattle Fire Department and the ATF investigators, no detailed exploration was conducted in these areas.

## **VII. Facts and Findings: General**

### **A. Weather**

Temperatures started out in the mid 70s at 17:00 hours on July 4, 2006, cooling to near 56 or 57 degrees at 01:00 hours on, July 5, 2006, near the time the fire started. Winds were out of the south to southwest around 5 knots between 17:00 hours, July 4, 2006 and 01:00 hours, July 5, 2006. After 01:00 hours, temperatures hovered in the 53 to 57 degree range around the area. Surface winds were generally out of the south to southwest 3-7 knots after 01:00 hours but there seemed to be a little more variation in speed and direction compared to earlier in the evening before the fire started. At approximately 04:00 hours an overcast layer of stratus clouds formed around the area with bases at 2000-2500 feet.

**NOTE:** An easterly wind direction, different from most other tracking stations within the area, was recorded by the Pacific Science Center, a City of Seattle attraction located at the Seattle Center next to the Seattle Space Needle and adjacent to MOC-P. This may be due to down slope winds from the Queen Anne Hill neighborhood across from Lake Union and MOC-P. This places the wind for MOC-P around 01:00 hours on July 5, 2006 as most likely out of the west-southwest around five to seven knots.

### **B. Security**

Security guard services are provided to MOC-P by a contractor. The last review of this contract was done in June 2006.

There is one guard post for MOC-P. This post operates twenty-four hours per day, seven days a week. From 06:00-18:00 hours, the security guard operates a fixed post that provides access control to the piers and other working areas. From 18:00-06:00 hours, the front gate is locked and the guard staffs a post that conducts roving patrols on the hour of the facility. There are ten stations that can be checked as follows:

1. Administration Building, 2<sup>nd</sup> floor, south end
2. Shop/maintenance building, outside of battery room
3. Boat shed, northeast corner on corner support
4. Pier A south pier at end on pole light
5. Pier B north pier at end on pole light
6. Paint locker, inside door
7. Inside warehouse, by shipping and receiving office
8. Outside warehouse, by gas pump
9. Warehouse, top of stairs ET storage
10. Boat shed, inside north end by boiler room



Five to ten stations per round, depending on instruction, are to be checked on each round. However, the contract guard officer on duty at the time of the fire reported the various DETEX clocks were not always checked because facility personnel had previously indicated this was no longer a requirement, including the ones at the end of both piers.

MOC-P is also equipped with a Closed Circuit Television (CCTV) which provides coverage of the interior areas of the facility from two, pan/tilt/zoom cameras mounted at the boat shed and the northwest corner of the shipping and receiving facility. A third, fixed unit is mounted on the maintenance shop. All CCTV units are black and white units installed shortly after April 1995. CCTV units are linked to a videocassette recorder (VCR) unit that last recorded in May 2005. This VCR unit was not operational at the time of the fire. All CCTV coverage at the time of fire was real time only.

The guard the night of the fire was scheduled for the 22:00-06:00, July 4, 2006 into July 5, 2006 shift. He came on duty that evening at 21:00 to provide one hour of overlap to manage traffic and personnel accessing the facility to watch the fireworks. The guard spoke to the facility manager about bottle rockets being fired off the pier at approximately 21:45. The facility manager said that he would address this situation and no more fireworks were discharged from the pier. The guard closed and locked the gates at 22:00 after checking on vehicles in the interior parking lot. Approximately fifty persons had entered the facility to watch the fireworks. The fireworks started at 22:10. Various witnesses reported the fireworks ending between 22:40 and 22:50. All persons were off the piers at 23:30 and the guard was the only person left at MOC-P.

The guard completed his midnight round at approximately 00:30, July 5, 2006 and everything was normal. During this round, the guard went on both piers to check on the ASSERTIVE and MCARTHUR II.

## C. Pier

The pier was constructed in 1963 and consisted of creosote wood pilings for protection from water immersion topped with a concrete and asphalt deck (Fig. 22). The pier was not equipped with a fire suppression system underneath the pilings, but it was constructed with draft stops located approximately every 100 feet to impede the spread of a fire (Fig. 23 and 24).



Fig. 22



Fig. 23

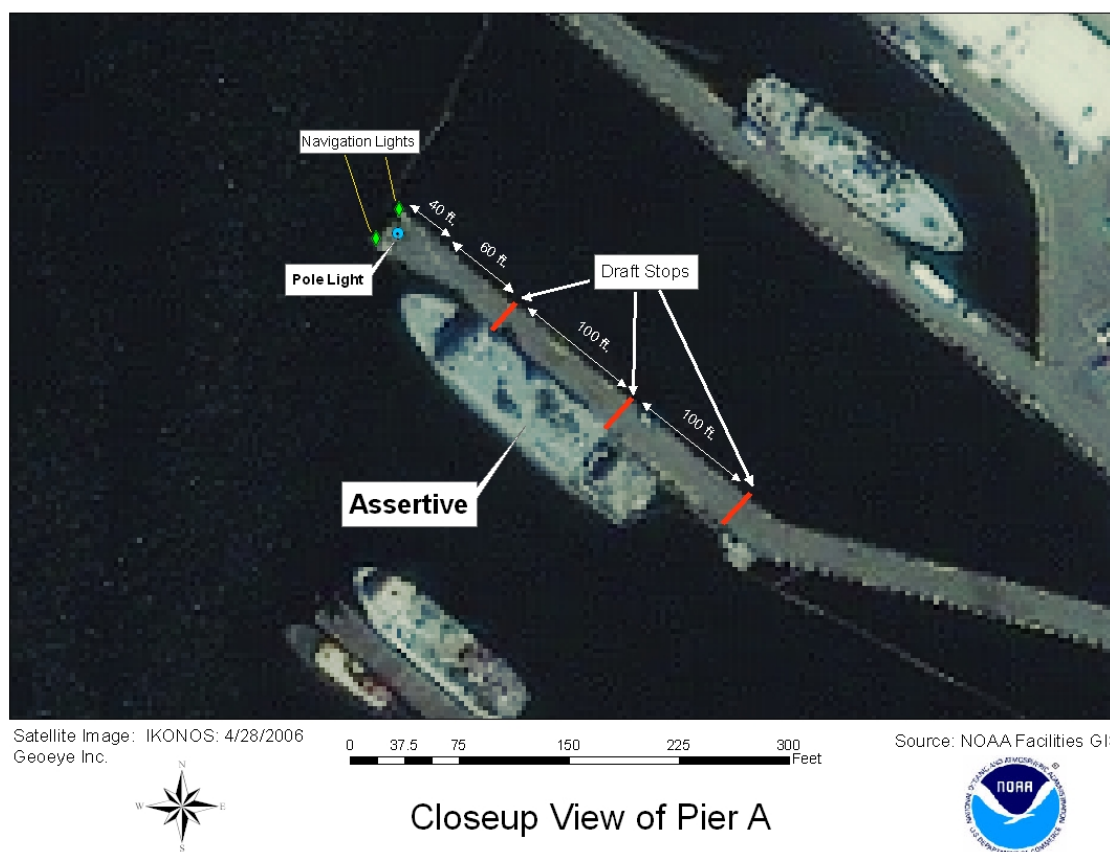


Fig. 24

## D. ASSERTIVE



Fig. 25

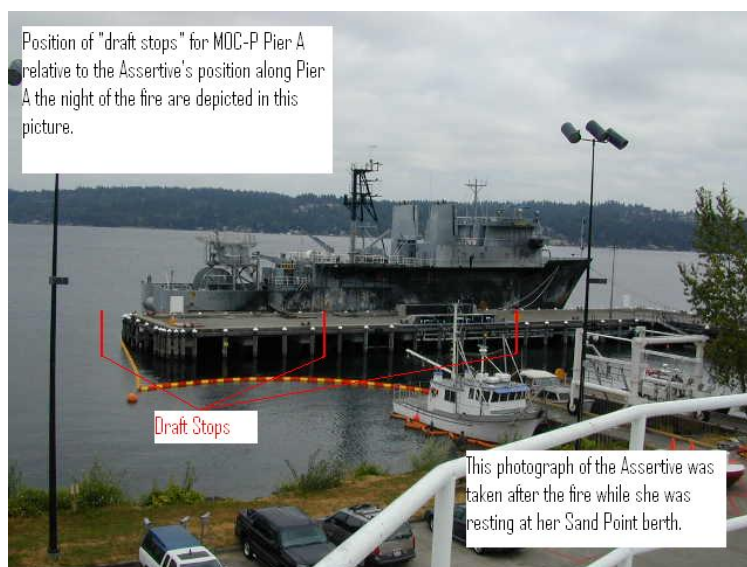


Fig. 26

The ASSERTIVE, a ship NOAA recently acquired from the United States Navy, was moored alongside Pier A when the fire erupted. Two distinctive burn marks are visible on the starboard side of the vessel (Fig. 25 and 26) with the first located approximately 60 feet back from the bow, and the other approximately 100 feet further down the starboard side from the first. The metallurgical evaluation of the ASSERTIVE, which was conducted by the MOC-P damage assessment team, indicated the hottest section of the two areas listed above was the marking located 60 feet from the bow of the vessel. The bow of the ASSERTIVE was 40 feet from the end of Pier A. The locations of these burn marks correspond to the draft stops on Pier A shown in Figure 24.

## VIII. Conclusions

1. The deterioration of the wiring and the switch panel supplying power to the right navigational light located on the end of Pier A caused an electrical fault in the wiring between the fuse box on the light pole and the right navigational light. This electrical fault generated sparks and molten metal that subsequently fell on the dry timbers of the platform below the main pier deck. This sheltered location was the point of ignition for this fire.
2. The ship-to-shore power cable to the ASSERTIVE did not malfunction, cause, or contribute to this fire.
3. The auxiliary (multiple receptacle) ship-to-shore power cable supply was not energized at the time of the fire, and therefore could not have caused nor contributed to this fire. Had this cable been energized, it would have been an inappropriate use of temporary flexible wiring to replace fixed wiring.
4. No fireworks were used on or immediately near the pier after 21:45 on July 4, 2006, and therefore fireworks was not the cause or contributing factor to this fire.
5. Arson or other criminal events were not a cause or contributing factor to this fire.
6. Had the pier had a sprinkler system installed underneath the deck, it would have limited fire damages to the end of Pier A, significantly reducing the damages caused by this fire.
7. The two burn marks alongside the ASSERTIVE, one approximately 60 feet from the bow and the other approximately 100 feet further down the starboard side, were caused as the pier draft stops delayed the progression of the fire until the fire burned deep enough to breach these wooden walls.
8. The MOC-P security guard on duty contacted 911 (Seattle Emergency Dispatcher), his supervisor and the facility manager in that order. His supervisor then took over notifications; however, requirements whom to notify beyond the facility manager was not clearly defined.
9. On the direction of MOC-P employees, the MOC-P Security Guard would not always check the DETEX clocks at the end of the piers. In some cases adverse weather conditions were cited as the reason not to check the DETEX clocks located on the piers.

## **IX. Recommendations**

The following recommendations are designed to mitigate against recurrence of future pier fires and the extent of damage should a pier fire occur. The recommendations are also designed to promote best management practices across NOAA. While the recommendations directly affect many NOAA Line Offices, the recommendations are being assigned to OCAO as the lead action office to promote standard practices and procedures in the affected areas across NOAA.

### High Priority – To Mitigate Recurrence of Pier Fires:

1. NOAA (OCAO) should review pier lease agreements and if not already include within these lease agreements, request annual electrical inspections and preventive maintenance of all electrical panels, shore power boxes and shore power cables and conduits be listed as a lease requirement.
2. NOAA (OCAO) should ensure NMAO, and other responsible Line Offices, conduct electrical inspections of all owned-piers by a licensed electrician at least annually.

### Medium Priority – To Mitigate Extent of Damages from Pier Fires:

3. NOAA (OCAO) should consider requiring NMAO, and other responsible Line Offices, to install fire prevention equipment, notably fire suppression sprinklers, on all currently-owned wooden piers; and include a similar requirement for all future construction of wooden piers.
4. NOAA (OCAO) should review pier lease agreements and if not already include within these lease agreements, consider the addition of fire suppression sprinklers on all wooden piers.

### Low Priority – Other Best management Practices:

5. NOAA (OCAO) should ensure Line Offices review existing and future DOC (Office of Security) Anti-Terrorism Risk Assessment Reports and take appropriate action in response to recommendations contained in those reports. NOAA (OCAO) should also identify best management practices from these reports and consider applying them across NOAA-owned facilities.
6. NOAA (OCAO) should require Line Offices review security guard post procedures at NOAA facilities for compliance with established security management practices. NOAA should coordinate this guidance and review with DOC's Office of Security.

7. NOAA (OCAO) should require Line Offices to evaluate all NOAA managed security camera installations and determine whether a scheduled replacement program for old video cameras is warranted, and also upgrading systems that record guard patrols. If camera coverage is warranted, these systems should have pan, tilt, and zoom capabilities, and should be color, low light units continuously recording to a digital video recording system with a date/time marking. Site lighting requirements should also be evaluated during this process. NOAA should coordinate this review with DOC security experts.

8. NOAA (OCAO) should require that all owned and leased facilities develop, maintain and issue a current phone tree card system which is accessible to security guards, facility management, and employees which will be used in the event of an emergency to ensure appropriate and timely notification of appropriate NOAA officials.

9. Although this fire occurred during non-working hours, NOAA (OCAO) should remind all staff to ensure they understand the appropriate emergency evacuation, accountability, and re-entry procedures for their work location.

10. NOAA (OCAO) should instruct all NOAA facility managers to review guard reports daily (guard log books) and act on the maintenance and other deficiencies noted within those log books.

11. NOAA (OCAO) should inform all NOAA facility managers to supervise and control access and operation of power panels and use of power systems or other services and type and placement of equipment on site by contractors. Although these services are conducted by contractors, facility managers should ensure pre and post-work inspections of these services are conducted by licensed professionals.

## Enclosures

### Enclosure 1

----- Original Message -----

Subject: July 4th Fireworks Viewing at MOC-P  
Date: Thu, 29 Jun 2006 13:48:49 -0700  
From: Mark Ablondi <CO.MOC.Pacific@noaa.gov>  
Organization: MOC-P  
To: MOP All <MOP.all@noaa.gov>

All,  
MOC/NMAO employees and their guests are authorized access to the pier area July 4 to view the fireworks display.

Please note:

- Guard will be checking ID's. Guests MUST be accompanied by a NOAA employee with valid government ID.
- Employees are responsible for guests' behavior while on base.
- Viewing is restricted to pier area only. NO ship access.
- NO ALCOHOL OR FIREWORKS ALLOWED.

Come and enjoy the fireworks from a great vantage point here at the center and have a safe and happy 4th of July weekend!

-----End of Message-----

**Enclosure 2**

Official Press Release from the Seattle Fire Department

**MEDIA INFORMATION**  
**7/7/06**

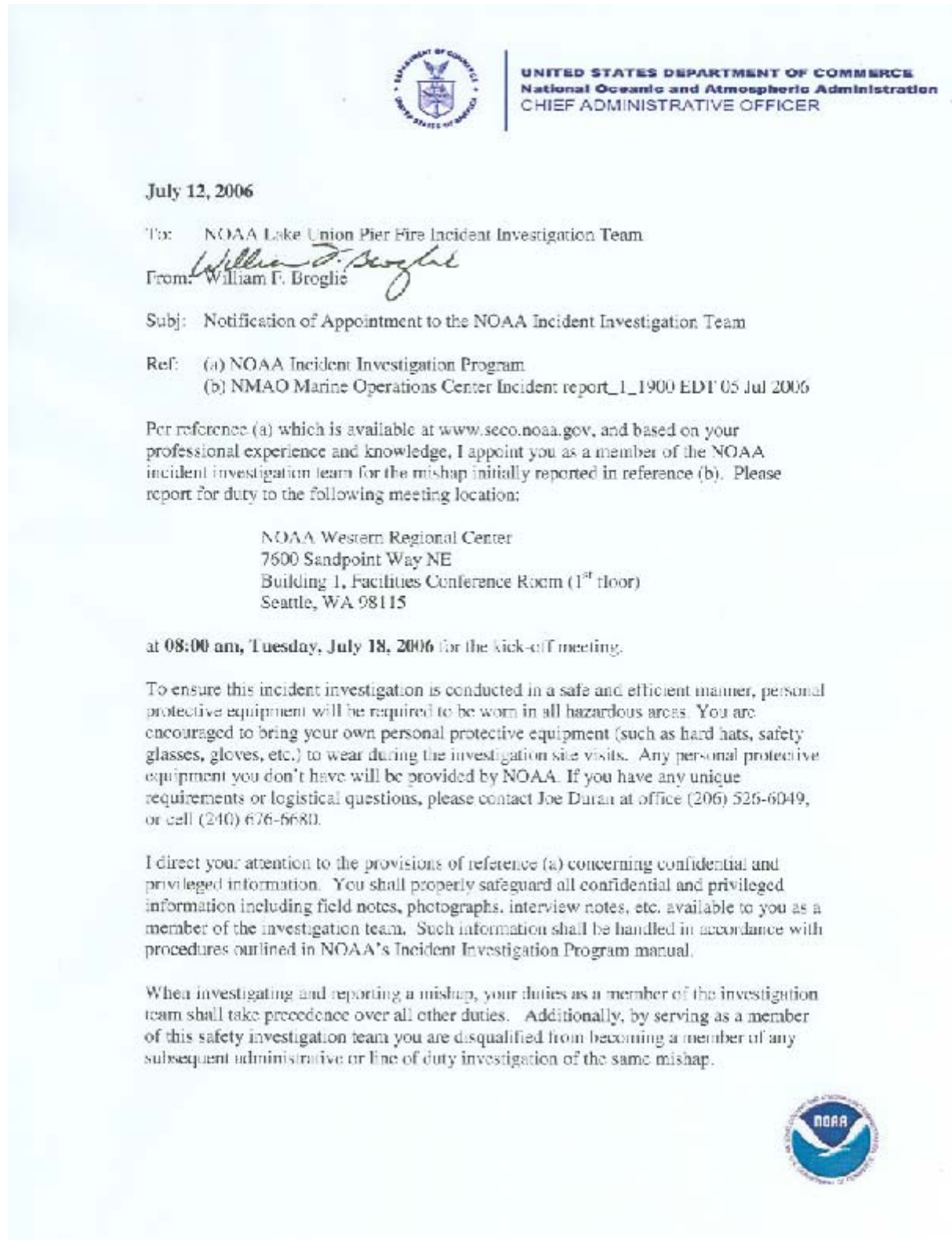
The investigation in to the four alarm fire that occurred on July 5 at the NOAA facility on Lake Union has been completed. Investigators have determined the fire was accidental and caused by an electrical problem in the ship to shore power system to the research vessel, the ASSERTIVE. The fire started on the first pier on the southern end of the facility. There is no damage estimate at this time because of the number of structures involved in the fire.

Over one hundred Seattle firefighters responded to the blaze as well as the fireboat, Alki and the fireboat, Chief Seattle. Seattle Police Harbor Patrol and a task force of firefighters from Kirkland, Redmond, Woodinville, Bothell and Bellevue assisted in the firefighting efforts. Six Seattle firefighters were transported to Harbor View Medical Center with minor injuries.

Contact: Helen Fitzpatrick, PIO (206) 386-1463



## Enclosure 3



The responsibility inherent in this appointment extends beyond any loyalties you may hold to your existing organization. NOAA's safety program depends on the efforts of safety investigators to analyze mishaps to identify and remove potential causes of injury and damage. The sole objective of the investigation is to determine underlying or contributing factors associated with the incident, so as to prevent mishap recurrence. Therefore, your efforts should include complete, open, and forthright expressions of your views. Rest assured the Incident Investigation Report shall be used within NOAA, for safety purposes only.

Should any circumstances arise which would preclude the proper performance of your duties as a member of this investigation team, please contact me (cell phone) 301-343-5351, or John Pierson, the designated Team Leader [John.Pierson@noaa.gov](mailto:John.Pierson@noaa.gov), (301) 713-2870 ext 102, or cell phone (202) 821-9891.

Enclosure (1) is a Terms of Reference document intended not to limit your investigative efforts, but to provide a framework for your investigation.

Enclosure (2) provides additional Team contact information, press releases, incident reports, and other additional information which you might wish to review prior to your arrival in Seattle.

Enclosures

**Enclosure 4****NOAA Marine Operations Center-Pacific Fire Investigation  
Terms of Reference  
11 July 2006****I. Overview**

At approximately 0130 PDT fire broke out at the Marine Operations Center-Pacific which is located at 1801 Fairview Avenue East, Seattle, Washington. Fire severely damaged pier A and pier B, as well as buildings labeled "shops" and "boiler shed." The preliminary press release by the Seattle Fire Department has concluded the fire is accidental and related to a ship-to-shore power system. NOAA's Incident Investigation Program, as adopted October 2005, requires a formal investigation following the procedures outlined within the program manual of all incidents when the losses are estimate to exceed \$1,000,000 as well as incidents of potentially high public/media interest. This incident triggers both of these independent criteria; therefore, a NOAA Incident Investigation is required.

**II. Mission Statement**

The mission of this investigation is to prevent mishap reoccurrence. As such, the investigation team shall focus on determining the causes for the fire and other factors which could have contributed to the fire or the severity of the damages. Contributing factors shall be explored to identify measures which were designed to prevent this type of fire, limit the severity should an ignition source occur, or provide early detection which would provide for immediate actions thereby reducing the extent of damages. This information and professional knowledge and experiences of the Team should then be used to formulate recommendations which can be implemented to prevent or reduce the severity of a similar fire in the future anywhere in NOAA.

**III. Concept of Operations**

This investigation will operate under the authority of NOAA's Safety and Environmental Compliance Office, an independent safety organization within NOAA. The daily operations of the investigation will follow NOAA's Incident Investigation Program, which is modeled after the National Transportation Safety Board (NTSB).

#### **IV. Location**

The investigation team shall primarily operate out of a conference room located at the NOAA Western Regional Center, Seattle, WA. The primary telephone point of contact is Joe Duran at (206) 526 – 6049. Site visits to MOC-P will be conducted as needed, and the drafting of the report will likely be completed via conference call and video teleconference between all team members.

#### **V. Organization**

- All members shall ensure complete, open, and forthright expressions of their views are considered in all areas, while consideration of individual talents and expertise is maximized. The members of the investigation team and their individual expertise include:
  - John Pierson, Director SECO, Team Leader
    - Expertise: Knowledge of the NOAA Safety Program
    - Cell phone: (202) 821-9891
    - Office phone: (301) 713-2870 extension 102
  - Joe Duran, NOAA Safety Officer (Seattle, WA)
    - Expertise: Team logistics, familiar with NIIP and experienced in final report drafting
    - Cell phone: (240) 676-6680
  - Ron Mattox, NOAA Safety Officer (Kansas City, MO)
    - Expertise: Familiar with NIIP, Fire investigation, and general NOAA safety procedures/requirements.
    - Cell phone: (240) 676-6683
  - Mike Amend, High-voltage Electrician, U.S. Naval Station Everett WA
    - Expertise: Ship-to-shore power cable systems
  - Inspector Hunton or Inspector Davalear , Fire Investigator – Seattle Fire Department
    - Expertise: Fire investigations and coordination with Seattle Fire Department
  - Tom Deseve, DOC Security
    - Expertise: Security and Departmental organization
    - Office phone: (202) 482-4361
    - Fax: (202) 482-0183
- Pre-identified Subject Matter Experts (SMEs) who are not part of the investigation Team and not expected to attend the initial meeting of the team, but will be available as needed for team consultation include:
  - Bill Cunningham, NOAA/NMAO Safety Officer
    - Expertise: Marine Operations and Marine Safety
    - Telephone: (301) 713 – 7666

- Email: Bill.Cunningham@noaa.gov
- Tino Escalona, NOAA/CAO Electrical Engineer
  - Expertise: Professional Engineer - Electrical Engineering
  - Telephone: (206) 526-6479
  - Email: Tino.Escalona@noaa.gov
- Ed Krawice, Consumer Product Safety Commission
  - Expertise: Electrical cables/ship-to-shore power cable system expertise
  - Available for telephone consultation
  - Telephone: (301) 424-6421 extension 119

## **VI. Report and Confidentiality**

The report should follow the pre-defined format within NOAA's Incident Investigation Program (NIIP) manual; however, the Team maybe permitted to follow a different reporting format after prior coordination and approval from the Director of NOAA's Safety and Environmental Compliance Office (SECO). Periodic briefings will be arranged, as required, between the Team, the Director of SECO and other senior management officials as appropriate.

All deliberative discussions and speculation of the Team shall be considered confidential by all members of the Team as well as the Director of SECO, until the final report is released. The Director of SECO will be available during this confidential deliberative stage for discussions regarding the scope of the investigation, requests for augmentation, request for preliminary release of information which might require immediate action on the part of NOAA or another organization,

A draft report will be provided to the Director of SECO no later than 30 days. Following the disposition of any comments the report will then go final. In accordance with NIIP procedures, the Director of SECO will contact those organizations identified in the final report to discuss the recommendations listed. SECO will establish a timeline in which these organizations can complete and submit their implementation plan of action. SECO will track each approved recommendation until completed.

Enclosure 5

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CANYON MOTOR REWIND

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**CANYON MOTOR REWIND INC.**

**502 Maple Ave.**

**Snohomish, WA 98290.2530**

**(360) 568-4171 (425) 743-4225**

**Fax (360) 568-4173**

**canyonmotorrewind,inc@verizon.net**

***"Pride in Service"***

31 July 2006

ATT: John Pierson and Bill Cunningham  
Dir of Safety & Compliance  
Station 11108 (OFA 54)  
1306 East West Highway  
Silver Springs, MD 20910.3278

Cc: John Wall, Port Engineer

Re: Ship-to-Shore power cable inspection

Dear Sirs,

The results of my inspection of my inspection of the ship-to-shore cable, for the USS Asseive, docked at Lake Union, Seattle, WA, are as follows.

RESULTS: There was no indication what-so-ever, that the shore power cable or the cable terminations were the cause of the fire on the pier.

POSSIBLE CAUSE: There is, however, a possibility, that the cable which runs under the pier could have shorted and started the fire.

If I can be of any further assistance, please do not hesitate to call.

Sincerely,



Ray Saddler  
Owner/President

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